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(71) Applicant *(for all designated States except US)*: THE PROCTER & GAMBLE COMPANY [US/US]; One Procter & Gamble Plaza, Cincinnati, OH 45202 (US).

(72) Inventor; and

(75) Inventor/Applicant *(for US only)*: PALUMBO, Gianfranco [IT/DE]; Georgenfeld 7, D-61352 Bad Homburg (DE).

(74) Agents: REED, T., David et al.; The Procter & Gamble Company, 5299 Spring Grove Avenue, Cincinnati, OH 45217 (US).

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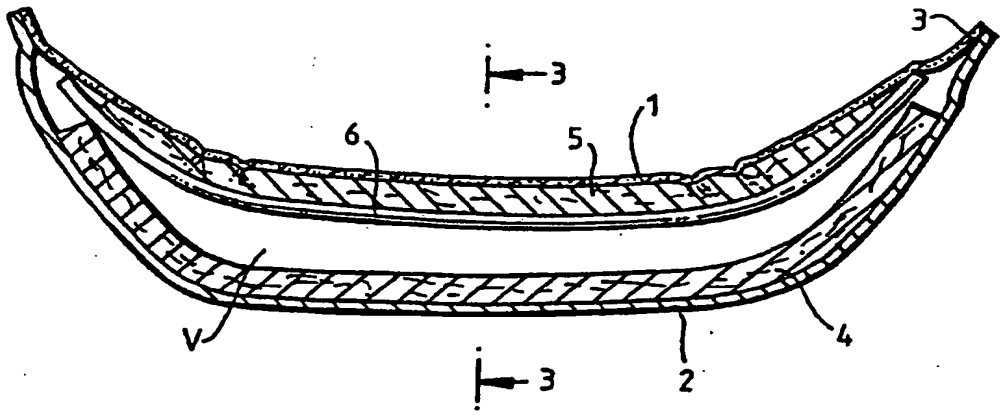
(54) Title: ELASTICATED INCONTINENCE PRODUCT WITH IMPROVED FLUID HANDLING CAPACITY



(57) Abstract

An absorbent sanitary article, for example a sanitary pad, comprises a fluid absorbing core (4), a first fluid receiving layer (1) positioned on one side of the fluid absorbing core, and spaced therefrom over at least part of its surface, by eleasticity, to define a void between the core and the first fluid receiving layer. A second fluid receiving layer (5) is positioned on the opposite side of the core to the first fluid receiving layer, the second fluid receiving layer being in fluid communication with the core and with the first fluid receiving layer.

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ELASTICATED INCONTINENCE PRODUCT WITH IMPROVED FLUID HANDLING CAPACITY

This invention relates to an absorbent article. It is particularly concerned with an absorbent article, for example in the form of a pad, which can be used by women suffering from light and moderate incontinence. The invention will be so described below. However, the invention is of more general applicability in relation to the absorption of body fluids, either urine or menstrua.

One problem associated with such articles is that urine may not go directly into the article, and be absorbed therein, but may flow along the user's body in a rearward direction and escape without ever entering the absorbent material of the article. This is particularly true in the case of gushes of urine which are of low volume or low flow rate.

Our copending Italian application filed on the same date as the present application, entitled Elasticated Pad for Body Contact Incontinence Product, and identified as CR133 describes an absorbent article which is so shaped to deal with this problem.

In the accompanying drawings:

Figure 1 is a perspective view of an embodiment of the article described in the said copending application;

Figure 2 is a longitudinal section through the article of Figure 1, taken along the longitudinal centre line thereof;

Figure 3 is a transverse section through the article of Figure 1, taken on the transverse centre line thereof; and

Figure 4 is a view similar to Figure 3 but showing a modified form of the article.

Figures 1 to 3 show an absorbent sanitary pad for use by a woman suffering from light incontinence. It comprises a fluid-permeable topsheet

1, a fluid-impermeable backsheet 2 which is sealed thereto, by a seal 3 at the periphery of the article, for example by heat sealing or adhesive. The article further comprises an absorbent core 4, for example one which contains an absorbent gelling material (AGM), and a secondary topsheet 5 which serves to receive fluid and transfer it to the core.

The materials used for the topsheet, backsheet and absorbent core may be those which are conventionally used for absorbent sanitary products. However, attention is directed to International Patent Publication WO94/28838 which describes an absorbent product having a secondary topsheet of high bulkiness, and to WO94/01069 and PCT/EP94/04215 which describe cores including AGM's, for further details of some suitable materials.

The article further comprises an elastication system which serves to cause the article to curve in a way which enables it to conform closely to the user's body and at least substantially prevent, or reduce, the risk of urine escaping past it. In Figures 1 to 3 this elastication system comprises an elastic thread 6 which runs along at least a major portion of the length of the article, preferably substantially the whole length of the article, beneath the secondary topsheet 5, and is attached at its ends, or along its whole length, or at selected points along its length, to the secondary topsheet and/or to the core. As can be seen, this causes the pad to assume a configuration which is upwardly concave as seen in longitudinal section (Figure 2), and upwardly convex as seen in transverse section (Figure 3). The pad is thus resiliently raised towards the body of the user and held in close contact with it, so providing a better fit and a better ability to acquire even the lightest release of urine. The core is relatively stiff, and stays substantially flat as view in transverse section, thus enabling it to maintain good contact with the user's panty.

Figure 4 shows a modified article which comprises in addition an elastic thread 7 which runs transversely above the core 2, and below the secondary topsheet 5 with its longitudinal elastic thread 6. The transverse elastic thread 7 is shown fixed to the secondary topsheet 5, though if it were slightly longer it could alternatively, or additionally, be fixed to the primary topsheet 1. In any event, it is preferably fixed only at its ends. By pulling the sides of the secondary topsheet and/or primary topsheet inwards, the transverse elastic thread assists in giving the article, as seen in transverse section, the desired upwardly convex shape.

Various other modifications are also possible. For example, only a transverse elastic thread may be provided, without any longitudinal elastic thread, or a plurality of transverse threads could be provided (with or without a longitudinal thread), the plurality being arranged close to one another or spaced along the length of the article, and the single longitudinal thread may be replaced by a plurality of longitudinal threads arranged close to one another.

The articles described above with reference to Figures 1 to 4, particularly when the or each elastic thread is positioned beneath the secondary topsheet, are advantageous in terms of their fit to the user and, hence, their ability to collect even small quantities of urine. However, the construction employed means that a void space, indicated as V in Figures 2, 3, and 4, is formed between the secondary topsheet and the core. The purpose of the secondary topsheet is to receive fluid temporarily and transmit it to the core for storage, and this void space may cause difficulties as regards the transmission process.

It is an object of the present invention to provide an article of the type described above with reference to Figures 1 to 4, but in which this fluid transmission problem is eliminated or at least reduced.

According to the invention there is provided an absorbent sanitary article, which comprises a fluid-absorbing core, a first fluid-receiving layer positioned on one side of the core and spaced therefrom over at least part of its surface to define a void between the core and the said fluid-receiving layer, and a second fluid-receiving layer positioned on the opposite side of the core to the first fluid-receiving layer, the said second fluid-receiving layer being in fluid communication with the core and with the first and fluid-receiving layer.

Two embodiments of the invention are shown in Figures 5 to 7 of the accompanying drawings, in which:

Figure 5 is a longitudinal section, taken on the longitudinal centre line of the first embodiment of the article;

Figure 6 is a transverse section, taken on the transverse centre line of the embodiment of Figure 5; and

Figure 7 is a view similar to Figure 6, but showing a second embodiment.

Figures 5 and 6 show a light incontinence pad having, like the article of Figures 1 to 3, a topsheet 1, a backsheet 2, a core 4 and a secondary, fluid-receiving, topsheet 5. In addition, there is a further fluid-receiving sheet 15 which is positioned between the core and the backsheet 2. The sheets 5 and 15 are in fluid communication with one another over at least part of the edge regions thereof. As shown in Figures 5 and 6 respectively, the sheets are both longer and wider than the core, and are bonded to one another, for example by adhesive, at their longitudinal ends and lateral edges, the seal between them extending completely around the periphery of both sheets. However, it is alternatively possible, for example, for the sheets to be bonded to one another only at their longitudinal ends (in which case it is not essential that they should be wider than the core), or only at

their lateral edges, in which case it is not essential that they should be longer than the core.

Figures 5 and 6 show by means of arrows the flow path of fluid which enters the article through the liquid-permeable topsheet 1. As can be seen, it flows longitudinally and laterally through the secondary sheet 5 and thence into the sheet 15, where again it flows longitudinally and laterally. The fluid can then be absorbed from the sheet 15 by the core 4, which is in intimate contact with it.

Under some circumstances, for example in the case of a sudden large gush of liquid, some of the liquid acquired by the secondary topsheet 5 may enter the void V directly from the secondary topsheet, and such liquid can then be absorbed by the core 4 without passing through the sheet 15.

The sheet 15 may be of the same material as the sheet 5, though it need not be. Whether or not the two sheets are of the same material, they may have the same or different thicknesses. Attention is directed to our Italian Patent Application No. TO94A000982, filed 1st December 1994, which describes an absorbent pad having fluid-receiving layers both above and below the core. Some suitable materials for the purpose are described therein.

In the modification shown in Figure 7, the sheets 5 and 15 are replaced by a single sheet 25 which surrounds the core 4 and void V and is bonded to itself along its lateral edges to give it a tubular form. It may also, or alternatively, be bonded to itself along its end edges.

In a further modification, a transversely extending elastic thread is provided, which runs across the surface of the core facing the void V and is attached at its ends to the secondary topsheet 5 and or the topsheet 1, as is shown in Figure 4 in relation to an article without a second fluid-receiving sheet 15.

CLAIMS:

1. An absorbent sanitary article, which comprises a fluid-absorbing core, a first fluid-receiving layer positioned on one side of the core and spaced therefrom over at least part of its surface to define a void between the core and the said fluid-receiving layer, and a second fluid-receiving layer positioned on the opposite side of the core to the first fluid-receiving layer, the said second fluid-receiving layer being in fluid communication with the core and with the first and fluid-receiving layer.

2. An article according to claim 1, comprising elastication means located between the core and the first fluid-receiving layer, the elastication means being in tension when the article is in a generally flat condition and acting to lift the first fluid-receiving layer away from the fluid-absorbing layer to create the said void.

3. An article according to claim 2, wherein the elastication means comprises at least one elastic thread running substantially along at least a major portion of the longitudinal centre line of the article.

4. An article according to claim 3, wherein the or each said thread is attached at its ends to at least one of the first fluid-receiving layer and the core.

5. An article according to claim 3, wherein the or each said thread is attached at selected points along its length to at least one of the first fluid-receiving layer and the core.

6. An article according to any one of claims 2 to 5, further comprising at least one further elastic thread extending transversely of the article and attached at its ends to at least one of the topsheet and the first fluid-receiving layer.

7. An article according to any preceding claim, wherein the first and second fluid-receiving layers are bonded to one another along a first edge region and along a second edge region at the opposite side or end of the layers.

8. An article according to any one of claims 1 to 6, wherein the first and second fluid-receiving layers are bonded to one another at least substantially along their complete peripheries.

9. An article according to any one of claim 1 to 6, wherein the first and second fluid-receiving layers are constituted by a single sheet of material folded around the core.

10. An article according to any preceding claim, further comprising a fluid-impermeable backsheet on the side of the second fluid-receiving layer remote from the core.

11. An article according to any preceding claim which is in the form of a sanitary pad.

FIG. 1

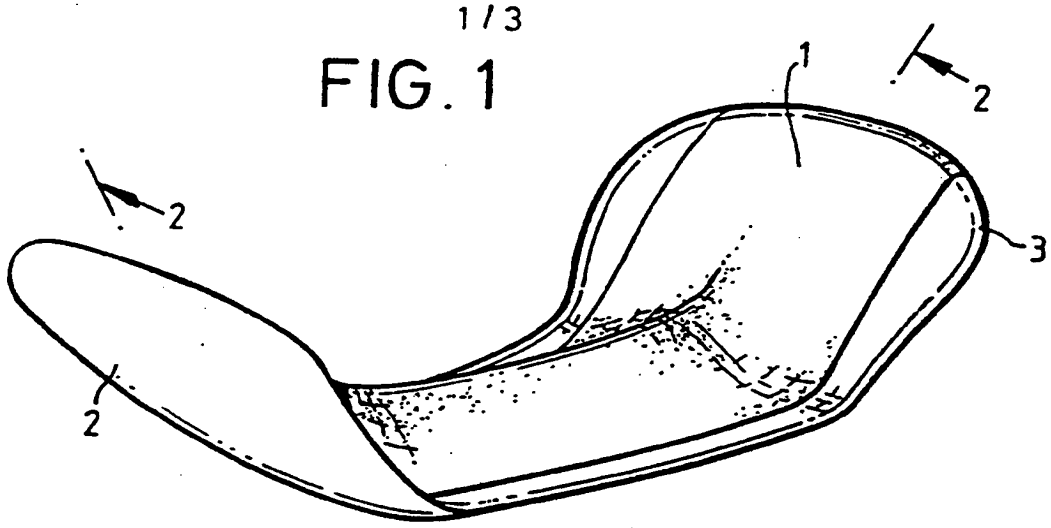


FIG. 2

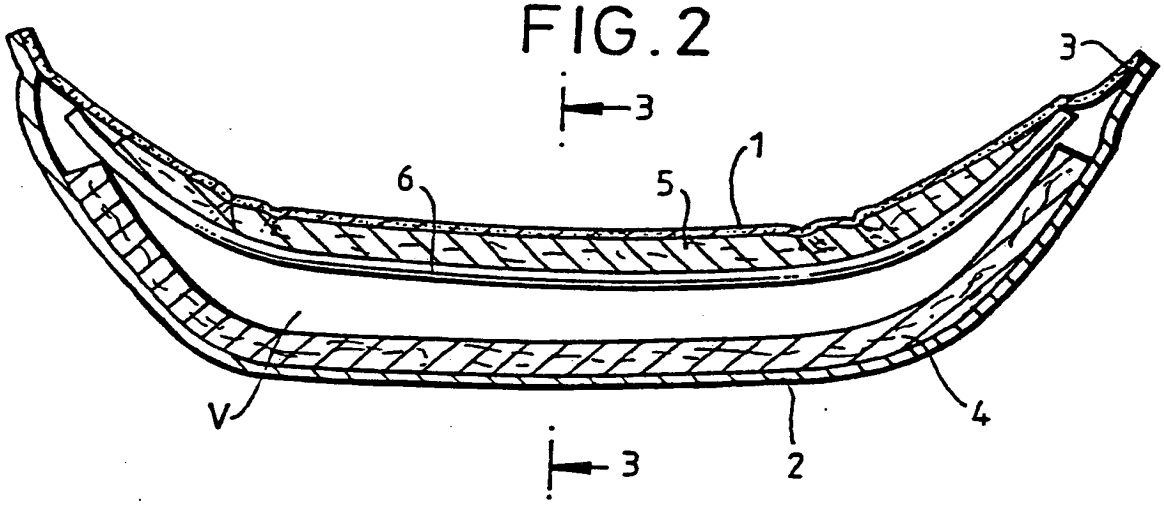
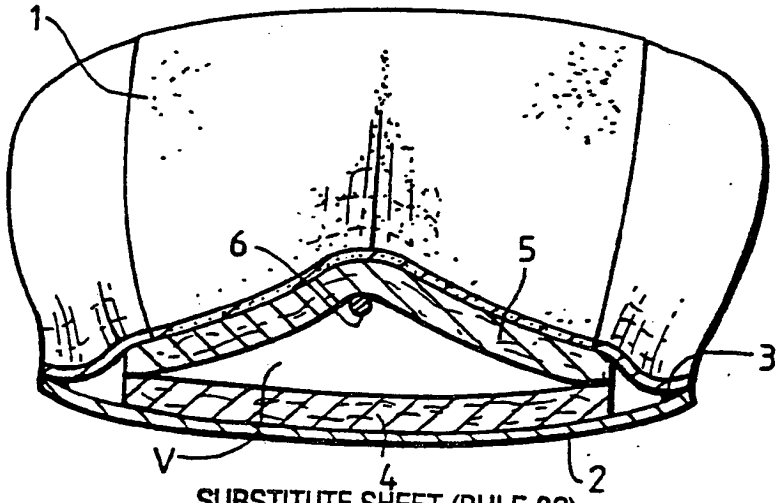


FIG. 3



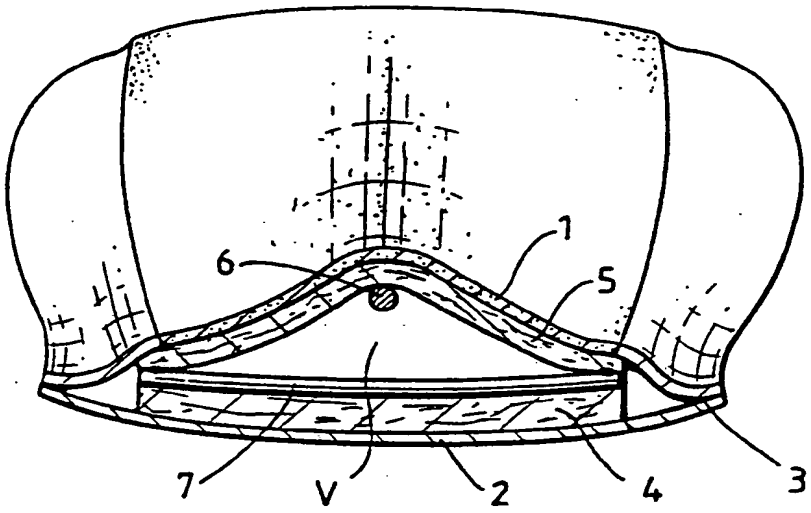


FIG. 4

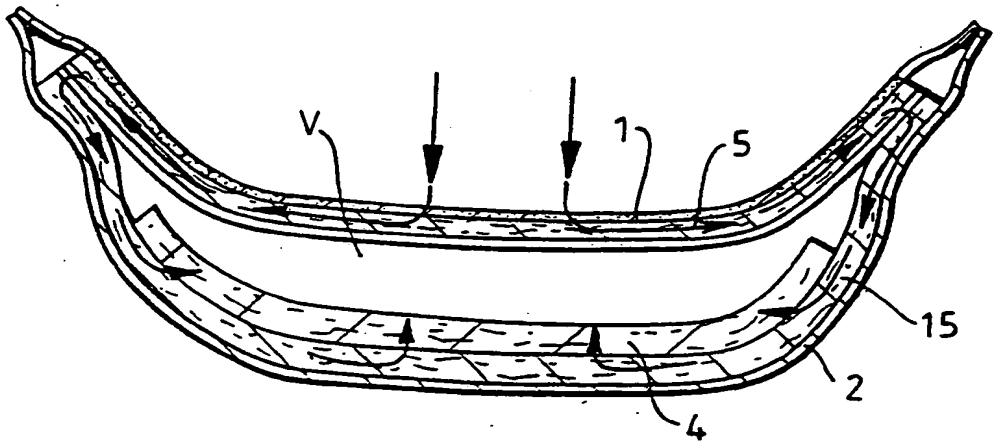


FIG. 5

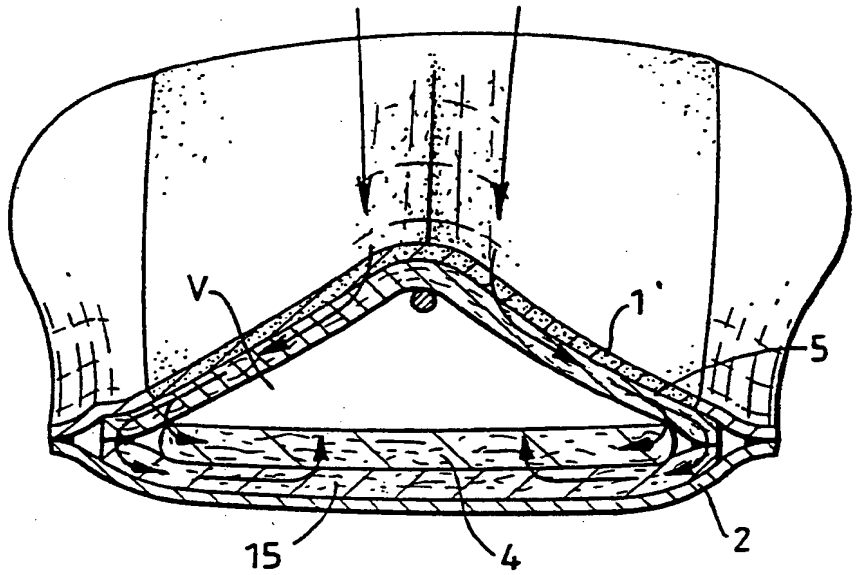


FIG. 6

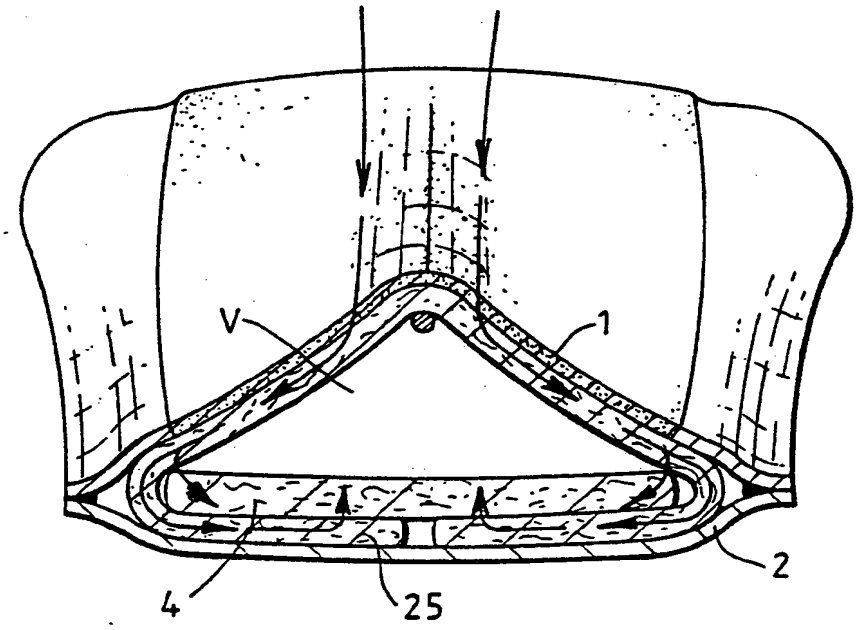


FIG. 7

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US96/13449

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) :A61F 13/15
US CL :604/385.2

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 604/385.1-390

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US, A, 4,892,536 (DESMARAIS ET AL.) 09 January 1990, see Fig, 3.	1-6
A	US, A, 5,324,278 (VISSCHER ET AL.) 28 June 1994, see Abstract.	1-6
A	US, A, 5,295,988 (MUCKENFUHS ET AL.) 22 March 1994, see Figs. 12 and 13.	1-6
A,E	US, A, 5,558,656 (BERGMAN) 24 September 1996, see Abstract, and Figs. 1-10.	1-6
A	US, A, 5,411,498 (FAHRENKRUG ET AL.) 02 May 1995, see Figs. 1-9, and Abstract.	1-6
A	US, A, 4,935,021 (HUFFMAN ET AL.) 19 June 1990, see Figs. 1-14.	1-6

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:

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Date of the actual completion of the international search	Date of mailing of the international search report
29 SEPTEMBER 1996	31 OCT 1996
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Form PCT/ISA/210 (second sheet)(July 1992)★

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US96/13449

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☒ Claims Nos.: 7-11
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest.

☐ No protest accompanied the payment of additional search fees.